jean-françois**pambrun**

researcher | engineer | software developer

about

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canada

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languages

french/english

programming

java, javascript
matlab, python
linux, git, c, c++
latex, tensorflow
azure, mongodb
docker, gcs
kubernetes
node, sql
postgres

standards

dicom, ihe, hl7
jpeg 2000, jpip

interests

medical imaging
image compression
machine learning
image analysis
infrastructure
performance
scalability
rendering

education

2011-2016 **Ph.D. in electrical engineering** — École de technologie supérieure (ÉTS)

improving medical image compression and transmission

- develop a novel image quality metric adapted to diagnostic imaging
- propose a novel jpeg 2000 bit allocation mechanism
- improve streaming for large image series (ct, mr, tomo, etc.)
- skills: research, compression, streaming, matlab, java, c++, itk/vtk

2009-2010 **M.Eng. in electrical engineering (incomplete‡)** — École de technologie supérieure (ÉTS)

evaluation of the diagnostic quality of lossy compressed medical images

- study medical image quality assessment and diagnostic losslessness
- quantify the ct acquisition parameters that affect compressibility
- skills: research, compression, matlab, java, c++, itk/vtk, cuda

2005-2009 **B.Eng. in electrical engineering** — École de technologie supérieure (ÉTS)

information technologies and telecommunication specialization

experience

2020-present **Principal Architect** — Change Healthcare

cloud-based PACS performance and scalability

- lead a cross-cutting team focused on full-stack performance
- architect cloud-native PACS components
- iteratively profile and improve client and server side performance
- define and measure key performance indicators
- implement distributed tracing and other instrumentation to track performance across users and releases
- implement websocket-based medical image streaming
- skills: node, kubernetes, gcp, chromium, opentelemetry, dicom

2018-2020 **Data Scientist** — Change Healthcare

FDA-approved pixel-based body-part classification for more relevant priors

- work with academic and clinical partners to acquire anonymized data
- design data ingestion and cleaning pipelines
- implement 3d bounding box dicom labeling tool across frames of reference
- design machine learning models
- train and validate models with proper data sampling
- skills: python, javascript, tensorflow, postgres, machine learning, k8s, gcp

† not a member of the OIQ
‡ fast-track phd admission

experience (cont.)

2016-2018 **Software Developer** nucleus.io

cloud-based diagnostic workstation with client-side MPR

- design and implement a client-side multi-planar reconstruction renderer
- design and implement a 3d compression algorithm for fast streaming
- design and implement annotation tools such as length, cobb angle, etc
- write highly optimized code using the latest web technologies
- ensure support for ct, mr, pet, ultrasound, large tomosynthesis, etc
- skills: javascript, nosql, mongodb, python, node, webgl, rendering, docker

2016 (jun-dec) **Postdoctoral Fellow** CHUM research centre

improve image-guided prostate cancer brachytherapy treatments

- implement mr-ultrasound fusion and segmentation using machine learning
- study the impact of dual energy ct (dect) on current registration algorithms
- evaluate an experimental non-rigid mr-us fusion workflow in the operating room
- skills: python, tensorflow, machine learning, registration, segmentation

2009 (jan-sep) **Software Developer** CAE inc.

head-up display simulation for military flight simulators

- implement c/c++ modules to stimulate and simulate avionic systems
- implement an opengl solution to simulate a fighter hud
- work with clients to address issues and achieve acceptance
- skills: c, c++, pascal, opengl, simulation

2006-2008 **Research Assistant** École de technologie supérieure (ÉTS)

implementation of a standard compliance validation tool for hl7v3

- implement a hl7v3 for validation prior to connectathon
- provide support for implementors
- skills: java, xml, xml schemas, xslt, soap, dicom, ihe, hl7

implementation and evaluation of a medical image streaming framework

- evaluate jpip for large image stacks and large image streaming
- skills: java, jpip, jpeg 2000

awards

2017	**NSERC postdoctoral fellowship (declined)**	90,000$
2017	**FRQNT postdoctoral fellowship (declined)**	70,000$
2016	**GRSTB postdoctoral fellowship**	18,000$
2011	**NSERC doctoral Alexander-Graham-Bell scholarship**	105,000$
2011	**ÉTS excellence graduate student scholarship**	60,000$
2011	**FRQNT doctoral research scholarship (declined)**	60,000$
2009	**FRQNT master's research scholarship**	30,000$
2006	**NSERC undergraduate student research award**	4,500$

publications

articles in peer-reviewed journals

The utilization of MRI in the operating room
Ménard C , Pambrun J-F, Kadoury S
Brachytherapy. Elsevier, 2017

Computed Tomography Image Compressibility and Limitations of Compression Ratio-Based Guidelines
Pambrun J.F. , Noumeir R.
Journal of Digital Imaging. Springer Science, 2015

Teaching DICOM by Problem Solving.
Noumeir R. , Pambrun J.F.
Journal of Digital Imaging. Springer Science, 2012

Streaming of medical images using JPEG2000 interactive protocol
Pambrun J.F. , Noumeir R.
International Journal of Innovative Computing and Applications. 2012

Using JPEG 2000 Interactive Protocol to Stream a Large Image or a Large Image Set
Noumeir R. , Pambrun J.F.
Journal of Digital Imaging. Springer Science, 2010

international peer-reviewed conferences/proceedings

Limitations of the SSIM quality metric in the context of diagnostic imaging
Pambrun J.F. , Noumeir R.
IEEE International Conference on Image Processing (ICIP), 2015

Compressibility variations of JPEG2000 compressed computed tomography
Pambrun J.F. , Noumeir R.
IEEE International Conference of the Engineering in Medicine and Biology Society (EMBC), 2013

Learning DICOM by solving real clinical problems
Noumeir R. , Pambrun J.F.
IEEE-EMBS International Conference on Biomedical and Health Informatics, 2012

Perceptual quantitative quality assessment of JPEG2000 compressed ct images with various slice thicknesses
Pambrun J.F. , Noumeir R.
IEEE International Conference on Multimedia and Expo, 2011

Interoperability testing of integration profiles based on HL7 standard version 3
Pambrun J.F. , Noumeir R.
IEEE International Conference on Information Technology and Applications in Biomedicine, 2010

Hands-on Approach for Teaching HL7 version 3
Noumeir R. , Pambrun J.F.
IEEE International Conference on Information Technology and Applications in Biomedicine, 2010

Streaming of Medical Images Using JPEG 2000 Interactive Protocol
Noumeir R. , Pambrun J.F.
IEEE International Conference on Systems, Signals and Image Processing. 2010

Interoperability Testing Software for Sharing Medical Documents and Images
Berube R. , Pambrun J.F, Noumeir R.
IEEE International Conference on Internet and Web Applications and Services. 2010

Images within the Electronic Health Record
Noumeir R. , Pambrun J.F.
IEEE International Conference on Image Processing. 2009